

REMARKS

The claims are claims 1 to 5, 7 to 12, 13 to 17 and 19 to 25.

The application has been amended at several places to correct minor errors. These amendments include a listing of the serial number of the U.K patent application cited on page 2, together with a citation of the corresponding U.S. patent claiming priority from this application.

Claims 1, 2, 5, 7, 8, 10, 11, 13, 14, 17, 19 to 23 and 25 have been amended. Claims 6, 12 and 18 are canceled. Claims 1, 7 and 13 have been amended to clarify the subject matter and particularly to further define the claimed "waiting." Claims 2, 8 and 14 have been amended to explicitly recite storage of the read data from the source port in the write reservation station of the destination port. This provides antecedent basis for the recitation of transferring this data from the write reservation station to the application unit (claim 3) or memory/device (claims 9 and 15) of the destination port. Claims 5, 11 and 17 have been amended to include subject matter recited in their respective canceled claims 6, 12 and 18. Claims 10 and 11 have been further amended to respond to the rejections under 35 U.S.C. 112. Claim 25 has been amended to adopt language employed in the specification in order to clarify the subject matter.

Claims 10 and 11 as amended are particular and definite as required by 35 U.S.C. 112. Claim 10 has been amended to change "plurality of hubs" to "plurality of ports" as suggested by the Examiner. Claim 11 has been amended to depend upon claim 7. This dependency corresponds to the dependency of parallel claims 5 and 17. Claim 11 has been amended to change "data transfer controller" to "data transfer hub" as recited in base claim 7. Claim 17 has been similarly amended.

Claim 25 is particular and definite as required by 35 U.S.C. 112. The Examiner points out an apparent contradiction between lines 25 to 34 of base claim 13 and lines 8 to 12 of claim 25. This application teaches at page 5, lines 23 to 29 and page 19, lines 8 to 13 that waiting the data read at the source port may not be needed if the destination port has a data transfer bandwidth on the same order as the data transfer hub. In this case, the destination port will accept data fast enough to eliminate substantial delays due to a destination port bottleneck. The Applicants respectfully submit that the application clearly teaches that the data transfer technique recited in claim 13 may be needed for some destination ports and not for others. Claim 25 recites a data port other than those claimed in claims 13 which does not require the write driven processing disclosed in this application. Accordingly, claim 25 recites other structures than those recited in claim 13 having other characteristics. Accordingly, these claims are not contradictory.

Claims 1, 7 and 13 recite subject matter not made obvious by the combination of Sindhu et al and Carn et al. Claims 1, 7 and 13 recite "in response to a data transfer request, query said destination port to determine if said destination port is capable of receiving data of a predetermined size, if said destination port is not capable of receiving data of said predetermined size, waiting by not reading data of said predetermined size from said source port corresponding to said data transfer request and not transferring data to said destination port until said destination port is capable of receiving data, and if said destination port is capable of receiving data of said predetermined size, reading data of said predetermined size from said source port and transferring said read data to said destination port." The OFFICE ACTION states at page 6, lines 1 to 11 that Sindhu et al fails to teach this subject matter. The OFFICE ACTION cites column 5, lines 21 to 35

of Carn et al as allegedly making obvious this subject matter. Carn et al states at column 3, lines 40 to 51:

"When a data processing device correctly receives a data packet, it immediately acknowledges receipt of that packet by return transmission of an acknowledgment code. If the data packet was processed upon receipt, a positive acknowledgment code (ACK) is returned. If the information packet was correctly received but could not be processed, a negative acknowledgment code (NAK) is returned. In a typical case, the negative acknowledgment code signals that the received data packet could not be processed upon receipt due to unavailability of a buffer, and therefore the received data packet was discarded."

This clearly states that data packets may be discarded "due to unavailability of a buffer." Carn et al states at column 5, lines 21 to 23 (part of the portion cited by the Examiner):

"Due to the practical constraint of limited buffer capacity, some messages destined for a busy channel must be discarded."

Taken together these portions of Carn et al teach discarding messages that cannot be received at their destination due to lack of a buffer. Claims 1, 7 and 13 require test for the existence of capacity at the destination port to receive data, then neither reading this data from its source nor transmitting it to its destination if the destination cannot receive it. The Applicant respectfully submits that Carn et al fails to teach checking for capacity to receive data at the destination. In addition, the above quoted portions of Carn et al indicate that such data may be read from its source, transmitted and then discarded if the destination cannot receive it. This is clearly contrary to the above quoted "waiting" recitations of claims 1, 7 and 13. Accordingly, claims 1, 7 and 13 are allowable over the combination of Sindhu et al and Carn et al.

Claims 2, 8 and 14 recite limitations not made obvious by the combination of Sindhu et al and Carn et al. Claims 2, 8 and 14 each recite that "each port includes at least one write reservation station." Claims 8 and 14 further recite that these write reservation stations are "for storing data prior to transfer to said corresponding external memory/device." Claims 2, 8 and 14 each recite determining "whether any write reservation station of said destination port has not been allocated for receipt of data" and if a write reservation is not allocated for receipt of data "determining said destination port can receive data and allocating a write reservation station for receipt of data." Lastly, claims 2, 8 and 14 each recite transferring "said read data to said allocated write reservation station of said destination port." These recitations of claims 2, 8 and 14 make clear that the claimed write reservation stations store data destined for the device connected to the destination port.

The Examiner has cited column 11, line 36 to column 12, line 6 of Sindhu et al as disclosing the claimed write reservation stations. The Applicant respectfully submits that Sindhu et al disclosed a different structure, serving a different purpose which is located in a different part of the apparatus. Sindhu et al states at column 7, lines 58 to 67 and especially at line 66 that reservation table 508 is a part of input switch 100. This is contrary to the recitation within claims 8 and 14 that the write reservation stations are located within the ports. Sindhu et al states at column 11, line 19 to 21:

"The reservation table is loaded such that at every cell slot a single read request is generated for each bank of memory 105."

Sindhu et al states at column 11, lines 36 to 38:

"Loaded entries 906 reflect read requests to be performed as a result of reservation requests received from individual multi-function multiports."

Sindhu et al states at column 11, lines 54 to 60:

"As read requests are processed by the read processor, certain ones of the placeholders 904 are converted to loaded entries 906 based on the read requests. Loaded entries 906 include a read request address."

Sindhu et al states at column 12, lines 3 to 5:

"The read processor transforms the placeholder 904 to a loaded entry 906 by writing the full address of the read request at the location (1006)."

These statements of Sindhu et al, including some statements within the portion cited in the OFFICE ACTION indicate that reservation table 508 stores read requests including the read address. This disclosure of Sindhu et al differs from the write reservation stations storing data destined for the device connected to the destination port. Since Sindhu et al discloses a differing structure, located in a different location within the apparatus, storing different data and employed for a different purpose, claims 2, 8 and 14 are allowable over the combination of Sindhu et al and Carn et al.

Claims 5, 11 and 17 recite subject matter not made obvious by the combination of Sindhu et al and Carn et al. Claims 5, 11 and 17 each recite "if a second data transfer request is pending querying said second destination port to determine if said second destination port is capable of receiving data of said predetermined size, if said second destination port is not capable of receiving data of said predetermined size, waiting by not reading data of said predetermined size from said source port corresponding to said

second data transfer request until said second destination port is capable of receiving data, and if said second destination port is capable of receiving data of said predetermined size, reading data of said predetermined size from said source port and transferring said read data to said second destination port." These recitations are similar to the recitations of respective base claims 1, 7 and 13 with regard to the first destination port. As detailed above Carn et al teaches that a data transmission may be discarded due to unavailability of buffer space at the destination contrary to the recitations of claims 5, 11 and 17. Accordingly, claims 5, 11 and 17 are allowable over the combination of Sindhu et al and Carn et al.

Claims 19 to 23 recite subject matter not made obvious by the combination of Sindhu et al, Carn et al and Godiwala et al. Claims 19 to 23 recite "said plurality of ports includes an internal port master; a data transfer bus connected to said internal port master and each of said data processors, said data transfer bus transferring data between said plurality of data processors and said data transfer hub via said internal port master." The Applicant respectfully submits that the combination of Sindhu et al, Carn et al and Godiwala et al fail to make obvious these structures. In particular, the cache teaching of Godiwala et al fails to make obvious that the cache service occurs via an internal memory port of the transfer controller with hub and ports and via a data transfer bus connected to that internal memory port. Accordingly, claims 19 to 23 are allowable over the combination of Sindhu et al, Carn et al and Godiwala et al.

The Applicants respectfully submit that all the present claims are allowable for the reasons set forth above. Therefore early reconsideration and advance to issue are respectfully requested.

If the Examiner has any questions or other correspondence regarding this application, Applicants request that the Examiner contact Applicants' attorney at the below listed telephone number and address to facilitate prosecution.

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Claim 25 is particular and definite as required by 35 U.S.C. 112. The Examiner points out an apparent contradiction between lines 25 to 34 of base claim 13 and lines 8 to 12 of claim 25. This application teaches at page 5, lines 23 to 29 and page 19, lines 8 to 13 that waiting the data read at the source port may not be needed if the destination port has a data transfer bandwidth on the same order as the data transfer hub. In this case, the destination port will accept data fast enough to eliminate substantial delays due to a destination port bottleneck. The Applicants respectfully submit that the application clearly teaches that the data transfer technique recited in claim 13 may be needed for some destination ports and not for others. Claim 25 recites a data port other than those claimed in claims 13 which does not require the write driven processing disclosed in this application. Accordingly, claim 25 recites other structures than those recited in claim 13 having other characteristics. Accordingly, these claims are not contradictory.

Claims 1, 7 and 13 recite subject matter not made obvious by the combination of Sindhu et al and Carn et al. Claims 1, 7 and 13 recite "in response to a data transfer request, query said destination port to determine if said destination port is capable of receiving data of a predetermined size, if said destination port is not capable of receiving data of said predetermined size, waiting by not reading data of said predetermined size from said source port corresponding to said data transfer request and not transferring data to said destination port until said destination port is capable of receiving data, and if said destination port is capable of receiving data of said predetermined size, reading data of said predetermined size from said source port and transferring said read data to said destination port." The OFFICE ACTION states at page 6, lines 1 to 11 that Sindhu et al fails to teach this subject matter. The OFFICE ACTION cites column 5, lines 21 to 35